

III. INDUSTRY SECTOR-SPECIFIC DATA

This section contains industry-specific TRI and compliance and enforcement data for the Sector Notebook Project industry sectors. For those sectors not required to report to TRI, only the table of five-year compliance and enforcement data by EPA Region is included. All other sector sections contain this table as well as tables listing TRI releases and transfers, largest volume TRI releasing facilities, and TRI source reduction and recycling activities.

1995 TRI Releases and Transfers by Number of Facilities Reporting

This section is designed to provide background information on the pollutant releases that are reported by this industry. For industries that are required to report, the best source of comparative pollutant release information is TRI Pursuant to EPCRA, TRI includes self-reported facility release and transfer data for over 600 toxic chemicals. Facilities within SIC Codes 20 through 39 (manufacturing industries) that have more than 10 employees, and that are above weight-based reporting thresholds are required to report TRI on-site releases and off-site transfers. The information presented within the sector notebooks is derived from the most recently available (1995) TRI reporting year (which includes over 600 chemicals), and focuses primarily on the on-site releases reported by each sector. Because TRI requires consistent reporting regardless of sector, it is an excellent tool for drawing comparisons across industries. TRI data provide the type, amount, and media receptor of each chemical released or transferred.

Although this document does not present historical information regarding TRI chemical releases over time, please note that, in general, toxic chemical releases have been declining. In fact, according to the 1995 TRI Public Data Release, reported on-site releases of toxic chemicals to the environment decreased by 5 percent (85.4 million pounds) between 1994 and 1995 (not including chemicals added and removed from the TRI chemical list during this period). Reported releases dropped by 46 percent between 1988 and 1995. Reported transfers of TRI chemicals to off-site locations increased by 0.4 percent (11.6 million pounds) between 1994 and 1995. More detailed information can be obtained from EPA's annual TRI Public Data Release book (which is available through the EPCRA Hotline at 800-535-0202), or directly from the TRIS database (for user support call 202-260-1531).

TRI Data Limitations

Certain limitations exist regarding TRI data. Within some sectors, (e.g. dry cleaning and printing) the majority of facilities are not subject to TRI reporting because they are not considered manufacturing industries, or because they are below TRI reporting thresholds. For these sectors, release

information from other data sources has been included. In addition, many facilities report more than one SIC code reflecting the multiple operations carried out on-site. Therefore, reported releases and transfers may or may not all be associated with the industrial operations described in a notebook.

The reader should also be aware that TRI "pounds released" data presented is not equivalent to a "risk" ranking for each industry. Weighting each pound of release equally does not factor in the relative toxicity of each chemical that is released. The Agency is in the process of developing an approach to assign toxicological weightings to each chemical released so that one can differentiate between pollutants with significant differences in toxicity.

Definitions Associated With TRI Data Tables

General Definitions

SIC Code -- is the Standard Industrial Classification (SIC) code, a statistical classification standard used for all establishment-based Federal economic statistics. The SIC codes facilitate comparisons between facility and industry data.

TRI Facilities -- are manufacturing facilities that have 10 or more full-time employees and are above established chemical throughput thresholds. Manufacturing facilities are defined as facilities in SIC primary codes 20-39. Facilities must submit estimates for all chemicals that are on the EPA's defined list and are above throughput thresholds.

Data Table Column Heading Definitions

The following definitions are based upon standard definitions developed by EPA's TRI Program. The categories below represent the possible pollutant destinations that can be reported.

RELEASES -- are on-site discharges of a toxic chemical to the environment. This includes emissions to the air, discharges to bodies of water, releases at the facility to land, as well as contained disposal into underground injection wells.

Releases to Air (Point and Fugitive Air Emissions) -- include all air emissions from industry activity. Point emissions occur through confined air streams as found in stacks, vents, ducts, or pipes. Fugitive emissions include equipment leaks, evaporative losses from surface impoundments and spills, and releases from building ventilation systems.

Releases to Water (Surface Water Discharges) -- encompass any releases going directly to streams, rivers, lakes, oceans, or other bodies of water.

Releases due to runoff, including storm water runoff, are also reportable to TRI.

Releases to Land -- occur within the boundaries of the reporting facility. Releases to land include disposal of toxic chemicals in landfills, land treatment/application farming, surface impoundments, and other disposal on land (such as spills, leaks, or waste piles).

Underground Injection -- is a contained release of a fluid into a subsurface well for the purpose of waste disposal. Wastes containing TRI chemicals are injected into either Class I wells or Class V wells. Class I wells are used to inject liquid hazardous wastes or dispose of industrial and municipal wastewaters beneath the lowermost underground source of drinking water. Class V wells are generally used to inject non-hazardous fluid into or above an underground source of drinking water. TRI reporting does not currently distinguish between these two types of wells, although there are important differences in environmental impact between these two methods of injection.

TRANSFERS -- are transfers of toxic chemicals in wastes to a facility that is geographically or physically separate from the facility reporting under TRI. Chemicals reported to TRI as transferred are sent to off-site facilities for the purpose of recycling, energy recovery, treatment, or disposal. The quantities reported represent a movement of the chemical away from the reporting facility. Except for off-site transfers for disposal, the reported quantities do not necessarily represent entry of the chemical into the environment.

Transfers to POTWs -- are wastewater transferred through pipes or sewers to a publicly owned treatment works (POTW). Treatment or removal of a chemical from the wastewater depends on the nature of the chemical, as well as the treatment methods present at the POTW. Not all TRI chemicals can be treated or removed by a POTW. Some chemicals, such as metals, may be removed but not destroyed and may be disposed of in landfills or discharged to receiving waters.

Transfers to Recycling -- are wastes sent off-site for the purposes of regenerating or recovery by a variety of recycling methods, including solvent recovery, metals recovery, and acid regeneration. Once these chemicals have been recycled, they may be returned to the originating facility or sold commercially.

Transfers to Energy Recovery -- are wastes combusted off-site in industrial furnaces for energy recovery. Treatment of a chemical by incineration is not considered to be energy recovery.

Transfers to Treatment -- are wastes moved off-site to be treated through a variety of methods, including neutralization, incineration, biological

destruction, or physical separation. In some cases, the chemicals are not destroyed but prepared for further waste management.

Transfers to Disposal -- are wastes taken to another facility for disposal, generally as a release to land or as an injection underground.

Carcinogens, Metals, and Ozone Depleters

Users of TRI information should be aware that the TRI data reflect releases and transfers of chemicals, not exposures and risks to the public of those chemicals. The determination of potential risk depends upon many factors, including the toxicity of the chemical, the fate of the chemical after it is released, and the human or other populations which are exposed to the chemical after its release. The TRI list consists of chemicals that vary widely in their toxic effects, degradation or persistence in the environment, and bioconcentration in the food chain.

A number of TRI chemicals can be classified into groups that may be of particular concern to human health and the environment. In the Sector Notebook Data Refresh - 1997, those TRI chemicals that can be classified as either carcinogens, metals, or ozone depleters, have been identified and labeled.

Carcinogens

Some chemicals on the TRI are listed because they are either known human carcinogens or suspect carcinogens. Known human carcinogens are those that have been shown to cause cancer in humans. Suspect carcinogens are those chemicals that have been shown to cause cancer in animals. Under EPCRA Section 313, a chemical does not have to be counted towards threshold and release calculations if it is present in a mixture below the *de minimis* concentration. The *de minimis* limitation is 0.1 percent if the chemical is a known or suspect carcinogen by virtue of appearing in one of three sources: National Toxicology Program (NTP), "Annual Report on Carcinogens"; International Agency for Research on Cancer (IARC) "Monographs"; or 29 CFR 1910, Subpart Z, Toxic and Hazardous Substances, Occupational Safety and Health Administration (OSHA). The *de minimis* limitation is 1.0 percent for chemicals that do not meet the above OSHA carcinogen criteria. The carcinogen designation in this document relates to any chemical that the Agency determined met the above OSHA criteria and therefore has the 0.1 percent *de minimis* limitation. More information on the specific bases for which individual chemicals were designated as a known or suspect carcinogens can be obtained from the "Toxic Release Inventory Public Data Release" (Latest Edition). (*To obtain a copy of the TRI Public Data Release, call the EPCRA Hotline at (800) 535-0202.*)

Metals

Metals (including the metal portion of metal compounds) are different from other TRI chemicals because they do not degrade in the environment and are not destroyed. Other TRI-listed chemicals can be destroyed by sunlight, heat, microorganisms, or other chemicals. Although metals cannot be destroyed, they may be converted to a less toxic form. For example, many facilities convert hexavalent chromium (a known carcinogen) to the less toxic trivalent form before releasing or transferring it to off-site locations. Other metal waste may be treated before disposal so that the metal will be less likely to be transported through soils. Although such treatment may limit the availability of the metal to the environment, it does not destroy the metal.

Ozone Depleters

Ozone depleters, such as chlorofluorocarbons (CFCs), halons, 1,1,1-trichloroethane (methyl chloroform), carbon tetrachloride, and bromomethane (methyl bromide), are known to release chlorine or bromine in the stratosphere (earth's upper atmosphere). Chlorine and bromine act as catalysts in the conversion of ozone to oxygen, thus reducing the amount of stratospheric ozone. Stratospheric ozone is important because it shields the earth from ultraviolet-B radiation, which has been shown to cause various adverse human health and environmental effects such as skin cancer, cataracts, and possibly suppressed immune systems. As the ozone layer diminishes, the amount of this harmful radiation reaching the earth's surface increases. These ozone depleters remain in the stratosphere for many decades; thus, emissions today will influence ozone levels far into the future.

Key

In the TRI chemical release and transfer tables in this document, chemicals that have been identified as known or suspect carcinogens are designated with "[C]" following the chemical name. Metals and metal compounds are designated with "[M]" following the chemical name. Ozone depleting chemicals are designated with "[O]" following the chemical name.

Ten Largest Volume TRI Releasing Facilities

The TRI database contains a detailed compilation of self-reported, facility-specific chemical releases. Facilities that have reported the primary SIC codes covered under a Sector Notebook appear on the first list. The next table contains additional facilities that have reported the SIC codes covered within that report, and one or more SIC codes that are not within the scope of that notebook. Therefore, the second list includes facilities that conduct multiple operations -- some that are under the scope of the notebook, and some that are not. Currently, the facility-level data do not allow pollutant

releases to be broken apart by industrial process.

Source Reduction and Recycling Activity

The Pollution Prevention Act of 1990 (PPA) requires facilities to report information about the management of TRI chemicals in waste and efforts made to eliminate or reduce those quantities. These data have been collected annually in Section 8 of the TRI reporting Form R beginning with the 1991 reporting year. The data summarized below cover the years 1994-1997 and are meant to provide a basic understanding of the quantities of waste handled by the industry, the methods typically used to manage this waste, and recent trends in these methods. TRI waste management data can be used to assess trends in source reduction within individual industries and facilities and for specific TRI chemicals. This information could then be used as a tool in identifying opportunities for pollution prevention and compliance assistance activities.

While the quantities reported for 1994 and 1995 are estimates of quantities already managed, the quantities listed by facilities for 1996 and 1997 are projections only. The PPA requires these projections to encourage facilities to consider future source reduction, not to establish any mandatory limits. Future-year estimates are not commitments that facilities reporting under TRI are required to meet.

Column B contains the total quantity of TRI chemicals in the waste from routine production operations in 1995. Values in Column C are intended to reveal the percent of production-related waste either transferred off-site or released to the environment. Column C is calculated by dividing the total TRI transfers and releases by the total quantity of production related waste. Columns D, E, and F show the percent of industry TRI wastes that were managed on-site through recycling, energy recovery, or treatment, respectively. Columns G, H, and I contain the percent of industry TRI wastes that were transferred off-site for recycling, energy recovery, or treatment, respectively. The remaining portion of production related wastes, shown in column J, is either released to the environment through direct discharges to air, land, water, and underground injection, or is transferred off-site for disposal.

Five-Year Enforcement and Compliance Summary

This table provides an overview of the reported compliance and enforcement data for an industry over the past five years (April 1992 to April 1997). These data are also broken out by EPA Regions thereby permitting geographical comparisons. See Section II.C. for a detailed description of the enforcement and compliance data contained in this document.